funkwerk
enterprise communications

WLAN ACCESS POINT

for office campus and industry

bintec W1002n

MPG certificated EM COMPATIBLE EN 60601-1-2

abg WiFi n CERTIFIED®
dual-stream n

- WLAN according IEEE 802.11n, compatible with .11agbh
- Dual band radio with 2.4 GHz, 5 GHz and 5.8 GHz
- Brutto transmission rates up to 300 Mbps
- Operation as access point, bridge, WDS, client
- PoE (Power over Ethernet)
- Certificated for operation in medical environments

- o WLAN according to IEEE 802.11n
- o Dual-band radio module with 2.4 GHz and 5 GHz
- o Physical data rates of up to 300 Mbps
- o Compatible with IEEE 802.11agbh devices
- o Operation as access point, bridge, WDS, client
- o Integrated VPN router, providing up to 110 tunnels simultaneously
- o Distinct increase of data rates for LAN-to-LAN coupling compared with conventional WLAN bridges
- o PoE (Power over Ethernet) according to IEEE 802.3af

With the IEEE 802.11n compatibility mode, the W1002n offers compatibility with all previous IEEE 802.11g or IEEE 802.11abgh clients and supports the mixed operation of clients according to IEEE 802.11n and clients according to IEEE 802.11b/g or IEEE 802.11a/h. This permits the trouble-free replacement of existing access points by the new W1002n without the necessity of exchanging the previous clients. Clients already supporting 802.11n will automatically benefit from the higher throughput and the better coverage of areas.

The operation of two W1002n devices in the bridge mode permits the setup of line-of-sight radio links. Here, again, the benefits of the IEEE 802.11n technology can be used by transferring two separate data streams. The application of dual polarization antennas permits easy installation. Dual polarization antennas consist of two antenna segments, which are polarized orthogonally to each other. They, therefore, provide 2 cable connections. This means that the W1002n transmits two separated partial streams from a to b, as defined by IEEE 802.11n. With this technology, more than triple the data rates can be reached compared to the previous technology. At a distance of 1000 m, net data rates of approximately 75 Mbps (TCP/IP) can be attained by using our dual polarization antennas.

The power supply is either performed by means of a highly efficient 230-V plug-in power supply or via PoE (Power over Ethernet) according to Standard IEEE 802.3af. In the case of operation via PoE, it suffices to use a default PoE injector or, for instance, a Funkwerk S128p switch with integrated PoE feeding. Expensive special PoE injectors are not required for the W1002n.

For the application on the medical sector, the W1002n has been granted admission according to EN60601-1-2, like its predecessor W1002. You can download the corresponding certificate in the download section, WLAN Products - Conformity Declarations.

Operating Modes

Feature	Description
WLAN disabled	In this operation mode the device is a powerful 2-port VPN router
WLAN access point	WLAN access point with VPN router functionalities
WLAN bridge	Point-to-point and point-to-multipoint mode (up to 8 links)
WLAN client	Transparent client for direct connection of Ethernet devices

Security

Feature	Description
Encryption WEP/WPA	WEP64 (40 Bit key), WEP128 (104 Bit key), WPA personal, WPA enterprise, WPA2 personal, WPA2 enterprise
IEEE802.11i authentication and encryption	802.1x/EAP-MD5, 802.1x/EAP-TLS, 802.1x/EAP-TTLS, 802.1x/EAP-PEAP, key management, PSK/TKIP encryption, AES encryption, 802.1x/EAP
Access control list (ACL)	MAC address filter for WLAN clients
VLAN	Network segments on layer2 possible. Per SSID one VLAN ID available. Static VLAN configuration according IEEE 802.1q; up to 32 VLANs supported.
Inter cell repeating	Inter traffic blocking for public hot spot (PHS) applications for preventing of communication radio client to radio client in a single radio cell.
NAT/PAT	Network & Port Address Translation / Stateful Packet Inspection: Isolation of complete network from public access
VPN - IPSec	10 tunnels inclusive, 100 more via separate license
VPN - IPSec	Powerful encryption up to 256 bits (AES, 3DES, DES, CAST, Blowfish, Twofish)
VPN - IPSec DPD	Dead Peer Detection for IPSec tunnels
VPN - PPTP	Integrated
VPN - PPTP	Strong encryption up to 128 bits (MPPE), up to 168 bits (DES/3DES, Blowfish)
DynDNS / DynVPN	Router can still be reached over the Internet in spite of dyn. IP address
IKE for IPSec	Pre-Shared Keys and X.509 certificate support
X.509	X.509 v1/v3 certificates (PKCS#7/8/10, 12, CLRs, SCEP)
QoS for IPSec	Available
PKI Support for IPSec	Available
NAT Traversal for IPSec	Available
IPCOMP	IP compression
IPSec / RADIUS	Available
IPSec redesign	Policy manager and interface concept
L2TP	Layer 2 tunnelling protocol for ATM, Ethernet, PPP; user authentication
GRE	V.0 according RFC 2784 for common encapsulation
Hardware encryption	3DES, AES and RC4

Wireless LAN Features

Feature	Description
WLAN standards	802.11n (Mimo 2x3); 802.11b; 802.11g; 802.11a; 802.11h
Frequency bands 2.4 GHz indoor/outdoor (EU)	2.4 GHz Indoor/Outdoor (2412-2472 MHz) max. 100 mW EiRP. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5 GHz indoor (EU)	5 GHz indoor (5150-5350 MHz) max. 200 mW EiRP allowed. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5 GHz outdoor (EU)	5 GHz outdoor (5470-5725 MHz) max. 1000 mW EiRP allowed. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5.8 GHz BFWA (Germany)	5.8 GHz BFWA (5755-5875 MHz) max. 4000 mW EiRP allowed. This information is related to the permitted transmission power in Germany. For the usage in other countries, please contact the location regulation authorities.
WLAN modes	2.4 GHz operation: 802.11b only; 802.11g only, 802.11b/g/n mixed; 802.11b/g/n mixed long; 802.11b/g/b mixed short; 802.11b/g/n; 802.11g/n; 802.11n only; 5 GHz Operation: 802.11a only; 802.11a/n; 802.11n only
Automatic Rate Selection (ARS)	Available
Transmission rate	Automatic fallback or fixed transmission rate selectable
Data rates for 802.11b,g (2.4 GHz)	11, 5.5, 2 und 1 Mbps (DSSS modulation); 54, 48, 36, 24, 18, 12, 9 and 6 Mbps (OFDM modulation)
Data rates for 802.11a,h (5 GHz)	54, 48, 36, 24, 18, 12, 9 and 6 Mbps (OFDM modulation)
Data rates for 802.11n (2.4 / 5 GHz)	MSC0-15 enables physical rates up to 150 Mbps at 20 MHz channels bandwidth, 2 streams, short guard interval; MSC0-15 enables physical data rates up to 300 Mbps at 40 MHz channels bandwidth, 2 streams, short guard interval
Receiver Sensitivity @ 2.4 GHz 802.11b/g	1 Mbps -91 dBm; 2 Mbps -90 dBm; 5.5 Mbps -89 dBm; 11 Mbps -88 dBm; 6 Mbps -90 dBm;9 Mbps -89 dBm; 12 Mbps -88 dBm; 18 Mbps -86 dBm; 24 Mbps -83 dBm; 36 Mbps -80 dBm; 48 Mbps -76 dBm; 54 Mbps -74 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 20 MHz	MSC0 -89 dBm; MSC1 -87 dBm; MCS2 -85 dBm; MCS3 -82 dBm; MCS4 -79 dBm; MSC5 -75 dBm; MCS6 -73 dBm; MCS7 -70 dBm; MCS8 -83 dBm; MCS9 -84 dBm; MCS10 -81 dBm; MCS11 -79 dBm; MCS12 -80 dBm; MCS13 -72 dBm; MCS14 -68 dBm; MCS15 -67 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 40 MHz	MSC0 -87 dBm; MSC1 -84 dBm; MCS2 -82 dBm; MCS3 -79 dBm; MCS4 -75 dBm; MSC5 -71 dBm; MCS6 -69 dBm; MCS7 -67 dBm; MCS8 -86 dBm; MCS9 -83 dBm; MCS10 -79 dBm; MCS11 -77 dBm; MCS12 -74 dBm; MCS13 -69 dBm; MCS14 -67 dBm; MCS15 -65 dBm
Receiver Sensitivity @ 5 GHz 802.11a/h	6 Mbps -88 dBm; 9 Mbps -87 dBm; 12 Mbps -86 dBm; 18 Mbps -84 dBm; 24 Mbps -82 dBm; 36 Mbps -78 dBm; 48 Mbps -74 dBm; 54 Mbps -73 dBm
Receiver Sensitivity @ 5 GHz 802.11n 20 MHz	MSC0 -88 dBm; MSC1 -85 dBm; MCS2 -83 dBm; MCS3 -81 dBm; MCS4 -78 dBm; MSC5 -74 dBm; MCS6 -72 dBm; MCS7 -70 dBm; MCS8 -88 dBm; MCS9 -85 dBm; MCS10 -83 dBm; MCS11 -80 dBm; MCS12 -77 dBm; MCS13 -72 dBm; MCS14 -70 dBm; MCS15 -68 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 40 MHz	MSC0 -84 dBm; MSC1 -82 dBm; MCS2 -79 dBm; MCS3 -77 dBm; MCS4 -74 dBm; MSC5 -69 dBm; MCS6 -67 dBm; MCS7 -66 dBm; MCS8 -83 dBm; MCS9 -82 dBm; MCS10 -79 dBm; MCS11 -76 dBm; MCS12 -72 dBm; MCS13 -68 dBm; MCS14 -66 dBm; MCS15 -64 dBm
Output power (without antenna gain)	Adjustable in following steps: 5, 8,11,14,16 und 17.5 dBm. Maximal power varies depending on data rate and frequency band.
Tx Power @ 2.4 GHz 802.11b/g	1 Mbps 16 dBm; 2 Mbps 16 dBm; 5.5 Mbps 16 dBm; 11 Mbps 16 dBm; 6 Mbps 17,5 dBm; 9 Mbps 17,5 dBm; 12 Mbps 17 dBm; 18 Mbps 17 dBm; 24 Mbps 15 dBm; 36 Mbps 15 dBm; 48 Mbps 13 dBm; 54 Mbps 13 dBm
Tx Power @ 2.4 GHz 802.11n 20 MHz/40 MHz	MSC0 17.5 dBm; MSC1 17,5 dBm; MCS2 17 dBm; MCS3 17 dBm; MCS4 15 dBm; MSC5 15 dBm; MCS6 13 dBm; MCS7 13 dBm; MCS8 17.5 dBm; MCS9 17.5 dBm; MCS10 17 dBm; MCS11 17 dBm; MCS12 15 dBm; MCS13 15 dBm; MCS14 13 dBm; MCS15 13 dBm
Tx Power @ 5 GHz 802.11b/g	1 Mbps 16 dBm; 2 Mbps 16 dBm; 5.5 Mbps 16 dBm; 11 Mbps 16 dBm; 6 Mbps 17.5 dBm; 9 Mbps 17.5 dBm; 12 Mbps 17 dBm; 18 Mbps 17 dBm; 24 Mbps 15 dBm; 36 Mbps 15 dBm; 48 Mbps 13 dBm; 54 Mbps 13 dBm
Tx Power @ 5 GHz 802.11n 20 MHz/40 MHz	MSC0 17.5 dBm; MSC1 17.5 dBm; MCS2 17 dBm; MCS3 17 dBm; MCS4 15 dBm; MSC5 15 dBm; MCS6 13 dBm; MCS7 13 dBm; MCS8 17.5 dBm; MCS9 17.5 dBm; MCS10 17 dBm; MCS11 17 dBm; MCS12 15 dBm; MCS13 15 dBm; MCS14 13 dBm; MCS15 13 dBm
Number of spatial streams (802.11n)	1 or 2
Bandwidth (802.11n)	20/40 MHz (bundling of two adjoining 20 MHz channels to one 40 MHz channel)
Short guard interval (802.11n)	On/off switchable; increase of throughput by reduction of the guard intervals from 800ns to 400ns
DTIM Period	Adjustable
Multi SSID	Depending on the complexity of configuration up to 8 service sets per radio module, with virtual access points and own MAC address per SSID.
Broadcast SSID	On/off switchable
Clients (Pwr. Managmt./max number)	Registering of up to 250 clients per radio module simultaneously in access point mode. Default

	value is 32 clients.
Country-specific settings	Channel settings according regulatory domain (802.11d) permitted.
TPC	TPC (transmission power control): For 5 GHz, automatic reduction of transmission power according EN301893
DFS	DFS (dynamic frequency selection): For 2.4 and 5 GHz, channels are dynamically used depending on operating grade. DFS is implemented in bridge links master and slave.
RTS/CTS	RTS/CTS threshold adjustable

Maintenance and Service

Feature	Description
Configuration a. maintenance: Device	Telnet, SSH, HTTP, HTTPS, SNMP
Configuration a. maintenance: SNMP	SNMP (v1, v2, v3), USM model, VACM views, SNMP traps (v1, v2, v3) configurable, SNMP IP access list configurable
Configuration a. maintenance: SNMP	Complete management with MIB-II, MIB 802.11, enterprise MIB
Configuration a. maintenance: SSH	Supports SSH V1.5 and SSH V2.0, for secure connections of terminal applications
Configuration a. maintenance: HTTP/HTTPS	Web-based configuration (FCI). The user interface is identical with almost all Funkwerk products.
Configuration a. maintenance: Secure	SSH available, HTTPS, Telnet protected against 'bruce force attacks'
Configuration a. maintenance: Configuration export and import	Load and save of configurations; save configuration optionally encrypted; optional, automatic controlled via scheduler
Configuration a. maintenance: On the	No restart is required after the configuration has been changed.
Configuration a. maintenance: Software update	Software updates free of charge; loadable via file, HTTP or via direct access to the FEC server; optional, automatic controlled via scheduler
External reporting: Syslog	Syslog client, with different levels of messaging.
External reporting: eMail alert	Automatic eMail alert by definable events
External reporting: SNMP traps	Supported
External reporting: Activity monitor	Sending of information to a PC on which Brickware is installed
Monitoring: Internal Log	Output via web-based configuration interface (http/https), filter: subsystem, level, message
Monitoring: IPSec	Displayed: IPSec tunnels and IPSec statistics; output via web-based configuration interface (http/https)
Monitoring: Interfaces	Statistic information of all physical and logical interfaces (ETH0, ETH1, SSIDx, ...)
Monitoring: WLAN	Detailed displays for radio, VSS, WDS link, bridge links, client links. Displayed are per link: MAC address, IP address, TX packets, RX packets, signal strength for every receiving aerial, signal-to-noise ratio, data rate
Monitoring: Configurable scheduler	Following events can be scheduled: Reboot device, activate/deactivate interface, activate/deactivate WLAN, initiate 5 GHz band scan, trigger SW update, trigger configuration backup
Management: Supported	WiLMA, DIME manager, XAdmin
Management: Discovery function	Protocols: Madge Discovery Protocol (MDP), Funkwerk discovery protocol (ADP), works also across subnets
Documentation	German and English documentation on CD and in the Internet for download
Guarantee	2-year manufacturer's guarantee, Online RMA handling

Software Features

Feature	Description
Roaming (access point mode)	Seamless roaming with IAPP (artem Inter Access Point Protocol)
Fast roaming 802.1x (access point	Pre authentication and PMK caching allows fast roaming by 802.1x encryption
Roaming behaviour (client mode)	Adjustable (no, slow, normal, fast, customized roaming). Adaptable for fast movable client (i.e. vehicle), to guarantee a roaming without interruption. This is achieved by scanning of the relevant channels in the background.
WDS	Wireless Distribution System: Include high security TKIP and AES, interoperable with other devices from the Funkwerk-EC portfolio (not bintec W500)
Bridge: point-to-point / point-to-multipoint	Point-to-point connection between two access points, point-to-multipoint connection between up to eight partners access points
Bridge	Full remote configuration: Protocol with encrypted transmission. RTS/CTS threshold adjustable. Operating channels: According to the regulatory domain. Transmit speed: Auto fallback or selectable fixed rate.
Bridge link test	Via the link test the quality of a bridge link can be measured.
Bridge link encryption	With high security TKIP and AES possible
Client mode	Routing or bridge mode possible. In bridge mode multiple IP based end devices can be operated simultaneously and additionally one non-IP-based end device
Buffer pool	For cushioning of peaks
WMM 802.11e QoS	Data prioritization for TOS data, 802.11e/WMM
WMM Power Save (U-APSD)	Support of active WLAN clients, which support 802.11e power save
Internet dialup	PPPoE, PPTP
Load balancing	Session-round-robin, load-dependent bandwidth
BLD	Broken Link Detection (BLD) per SSID possible.
NTP	NTP client, NTP server, manually
DNS	DNS client, DNS server, DNS relay
DHCP	DHCP client, DHCP server, DHPC relay

Hardware Features

Feature	Description
Certifications	Wi-Fi Certified according 802.11abgn (Rel.7.9.4)
Standards and certifications	R&TTE Directive 1999/5/EG; EN 60950-1 (IEC60950); EN 300 328; EN 301 489-17; EN 301 489-1; EN 301 893; EN 60601-1-2 (medical electrical devices - Part 1-2)
LAN / WAN	2 x 10/100 Mbps Ethernet twisted pair, autosensing, auto MDI/MDI-X
Serial interface	V.24 interface with D-Sub9 jack for configuration
WLAN	IEEE 802.11a/b/g/n; 1 radio module, 2.4 und 5 GHz band, 3 external antennas
Antenna	Three antenna connectors with RTNC jacks; delivered incl. three 2.5 dBi omni-directional antennas
Real time clock	Even at power loss the system time will be available for several hours.
Power supply	External wall power supply 230V / 12 V DC, 1 A, with high efficient switching power supply
PoE	Power-over-Ethernet according IEEE 802.3af
Status LEDs	Status + activity for WLAN, Ethernet 1, Ethernet 2
Theft protection	Theft protection optional available
Wall mounting	Integrated in the housing design
Dimensions	Approx. 16.3 cm x 16.8 cm x 5 cm (width x depth x hight)
Weight	Approx. 400 g
Power consumption	Less than 10 Watt
Environment	Temperature operating: 0°C to 40°C; storage: -10°C to 70°C; rel. humidity 10 to 95% (non condensing)